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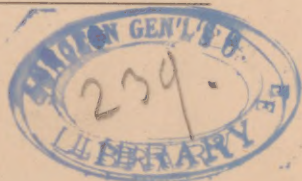
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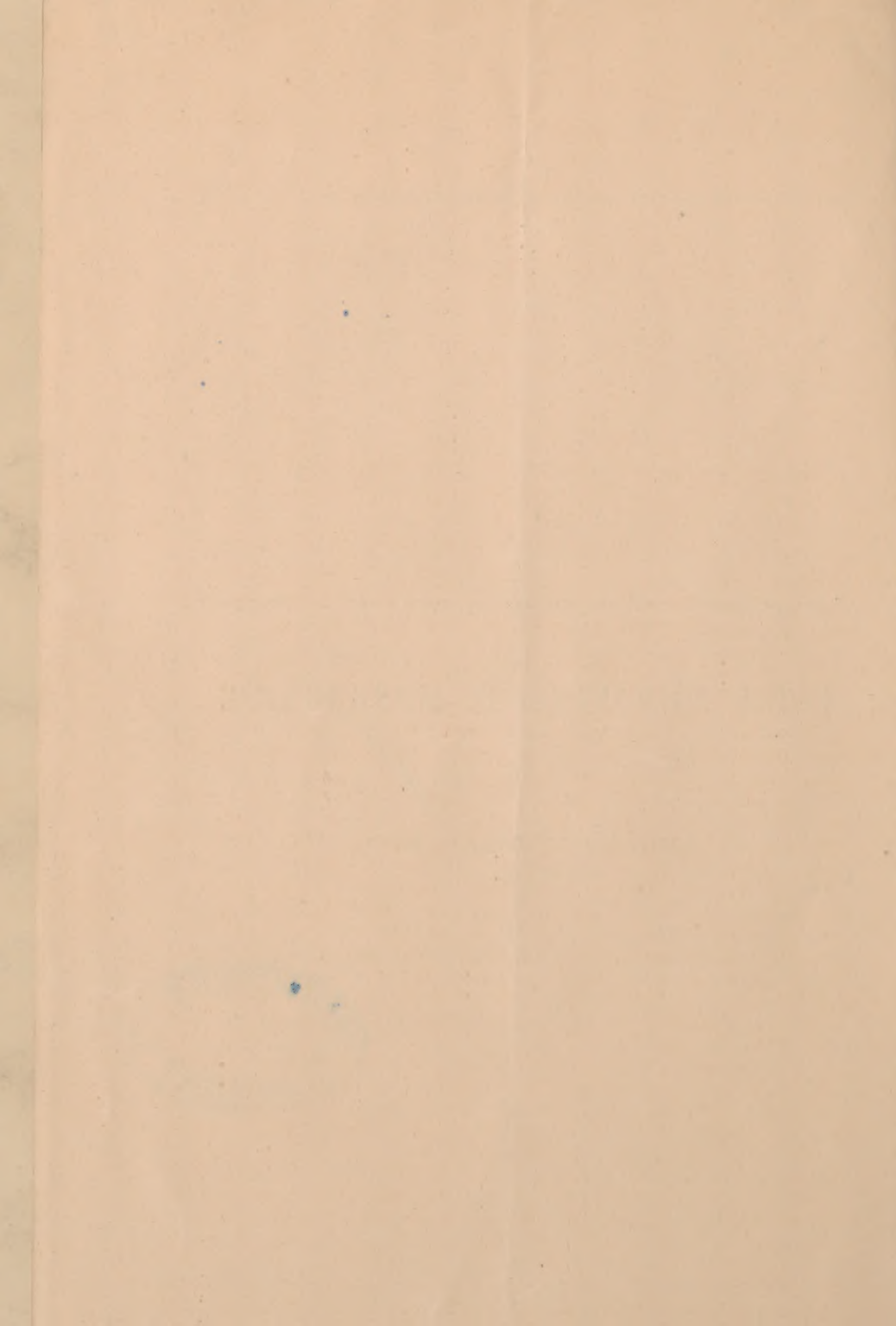
Extracted from the American Journal of the Medical Sciences for October, 1880.

FATAL POISONING BY MUSHROOMS.

BY

ADOLPH KESSLER, M. D.,
OF NEW YORK CITY.





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THE comparatively rare occurrence of fatal poisoning by mushrooms and its somewhat obscure pathology and symptomatology induce me to publish a report of the following two cases which happened simultaneously in the same family. Not having been able to obtain from the physician in attendance until my arrival an account of the earlier history, I am obliged to give it in the words of the surviving patient, a highly intelligent college student residing in Stamford, Conn., where the cases occurred.

CASE I.—Mr. H. writes as follows: "On the 31st of August (1879), in the evening I started out to get some mushrooms for tea. I had had some the day before for dinner, and they tasted very nicely and had done me no harm. I picked about two dozen on the lawn, and as I returned with them my cousin proposed to go out to one of the pasture fields to get some more, which we did accordingly.

"The number of plants gathered amounted to about three dozen of all sizes; as to their name I am in ignorance. We supposed them to be the common edible mushrooms. In colour they were for the most part of a bright and clear white; some few of those we gathered later had a brownish tinge on the top. They were partly full-grown, that is, the cap or top (pileus) had spread itself out, and the peculiar formation of the plant was strongly marked on the under side; partly they consisted of the small undeveloped buttons growing near the ground. We applied the test of peeling the cap to all that appeared suspicious. The mushrooms were fried or boiled and brought on the table that evening. My cousin ate a good many, as he was very fond of them, my mother just tasted one, and I partook of them liberally.

"After tea we walked down to the village, and partook of some ice-cream and sat down on the veranda of the hotel smoking. That same night my cousin was taken sick with violent nausea and pain in the stomach; I did not feel any ill effects the next morning, and drove down town to summon a physician. He came and prescribed an opium powder to be taken every hour, thinking that the sickness resulted from overloading the stomach. Towards noon I also felt ill, but did not take any of the powders, while my cousin took them regularly. I vomited once or twice during the afternoon, and oftener in the evening. Next morning the doctor gave each of us a hypodermic injection of morphia; we vomited before that very frequently, though we had little or nothing on our stomach. I was also attacked with very severe diarrhoea, but this symptom did not manifest itself in the case of my cousin. The doctor further prescribed some large

white pills (I think bismuth) of which I took a couple. After the hypodermic injection the vomiting and looseness of the bowels disappeared for the time, and I was thrown into a kind of stupor, which lasted till the afternoon when the former symptoms reappeared. We suffered greatly from nausea, vomiting, burning thirst, headache, and I from diarrhoea, which probably had been checked in my cousin's case by the quantity of opium taken the day before. That evening, I think, you were called in."

In obedience to a summons by telegram, I went to Stamford and I found Mr. H. just recovering from the effects of the last hypodermic injection, and greatly annoyed by an incessant nausea and tenesmus. He piteously implored me to relieve him and to administer another subcutaneous injection of morphia, but believing that all of the *materia peccans* had not been removed from the intestinal tract, and finding the patient possessed with a fair amount of strength, and with a pretty good pulse, I firmly refused to comply with his request, but, on the contrary, considered it my duty to aid nature in her efforts to eliminate the poisonous substances, which were still retained and kept up the gastro-intestinal irritation, by administering hot drinks and purgative enemata carried high up—which kept the patient almost all night vomiting and especially purging. With the thorough removal of the mushrooms the symptoms of gastro-intestinal irritation entirely and at once abated, and towards morning the patient was not only free from all danger and the distressing pains of the last two days, but bright and cheerful. The stomach having speedily regained its normal functions I was enabled to adopt an appropriate course of treatment, which resulted in the patient's rapid recovery of his previous health and strength.

CASE II.—Far different, however, was the condition of the other patient, Mr. C., aged 24 years, a student of divinity, who was shortly to be ordained. My first impression upon seeing him was that he appeared to be doomed, alarming symptoms of collapse being apparent, such as I had frequently had occasion to observe in fatal cases of Asiatic cholera.

The face and entire surface of the body were bathed with a cold clammy sweat, the extremities were cold, the eyes deeply sunk in their sockets, the colour of the countenance ashy pale with livid contours around the lips and nose, the features pinched and shrunken, the pulse exceedingly weak and at times scarcely perceptible, the impulse of the heart faint, irregular, and intermitting, the respiration shallow, short, and oppressed, the intellect apathetic and obtuse, and the whole aspect of the patient that of a deep sopor from which he was occasionally roused by complaints of an excruciating pain in the epigastrium and an insatiable thirst.

The first indication to be fulfilled was, of course, the vital one to sustain the life that was fast ebbing away; I, therefore, injected at once subcutaneously large quantities of camphor, ether, musk, and alcohol, applied artificial heat and rubefacients and excited the cutaneous surface by stimulating frictions, persevering in that course until a favourable reaction began to set in, and pulse, temperature, colour, countenance, and the mental complexion showed visible signs of improvement.

The imminent danger of fatal collapse having passed for the time, I turned my attention next to the neutralization and elimination of the poison. But my efforts in that direction were unfortunately rendered futile by the extremely irritable and intolerant condition of the stomach which caused the almost immediate rejection of even a teaspoonful of iced water or champagne.

The internal administration of tannic acid as a partially efficacious chemical antidote and of cathartics for the speedy removal of the poisonous matter from the alimentary canal being thus rendered impossible, I had to resort to rectal medication and purgative enemata, but met here also with considerable difficulty. For although making use of a long tube and carrying it high up into the colon the injected fluid passed off almost immediately, neither the medicated, nor the purgative and nutritive clysters were retained and the discharge of fecal matter was quite scanty. The bowels had not once spontaneously moved since the patient was taken ill, and all efforts of freeing the system from the poison by active purgation threatened to fail. Feeding and medication by the rectum were furthermore aggravated by the patient's exhaustion, as any long-continued change of position or brisk movements were apt to induce syncope and slight collapse accompanied with severe and painful vomiting.

In this emergency while nervous prostration, gastric inflammation and intestinal torpor stubbornly combined against the pursuance of a rational and radical mode of treatment, I resolved as my last resort to employ atropia subcutaneously. Although left in ignorance of the true character of the ingested mushrooms—whether merely bad and partly decayed or truly poisonous—and although the patients were in no condition to throw any light upon the matter, I had reason to suspect from the symptoms that presented themselves the ingestion of a fungus-poison. The purely gastro-intestinal disturbances of Mr. H. seemed to be due merely to unsound mushrooms, whereas, the predominant nervous symptoms in the case of Mr. C., with the alarming signs of coma and collapse pointed with almost positive certainty to the presence of a noxious poison affecting alike the central nervous system and the organs of circulation and respiration. Another marked and positive symptom of seemingly great importance, because common in cases of poisoning by fungi, was the considerable pupillary contraction, but that might also have been due to the large amount of opium taken internally and hypodermically before I saw the patient. Under all the circumstances, however, I was justified in suspecting the presence of a specific fungus-poison, and as all direct methods of treatment for the purpose of neutralizing and eliminating the same failed, I determined to test the efficacy of atropia as an antidote.

Schmiedeberg and Koppe had succeeded in obtaining from *amanita muscaria* a poisonous alkaloid—muscarine—closely resembling if not wholly identical in its toxic effects with the alkaloids gained from other fungi—such as bulbosine from *amanita phalloides* or *agaricus bulbosus*, the alkaloid obtained from *boletus luridus*, and others—and they further established by experiments upon animals the fact that atropia acted as a true antidote in cases of poisoning by muscarine.

Acting upon their suggestion, I injected in the first night, subcutaneously, one-fiftieth of a grain of the sulphate of atropia, and the effect of that dose seemed to be remarkable. Not only did the pupils speedily respond to the action of the drug, but the brain and stomach symptoms greatly improved, and the heart, lungs, and arteries exhibited more force and regularity in their functions. It is scarcely necessary to say that I, profiting by this experience, followed up this treatment during the next three days, and the very great improvement which took place within that time appeared in a large measure to be due to the atropia. The bowels and bladder, that had been absolutely torpid heretofore, acted now with greater force, rectal feeding and medication could be regularly conducted,

the mind assumed a brighter and more cheerful complexion, the intellect regained its former clearness and vigour, and, apart from the gastric trouble, the patient did not complain of pain or distress. His weak and anæmic condition forbidding the application of leeches to the epigastrium, I had, almost immediately after taking charge of the case, commenced treating the acute gastritis with a large fly-blister, the ice-bladder, and absolute stomachal rest. No food or drink whatsoever, not even a small piece of ice, much as the patient begged and yearned for it, was allowed by the mouth; and that absolute prohibition of stomachal alimentation, perhaps more than the remedial measures employed, conquered not only all pain and nausea, but restored to the organ, after three days, so much of its strength and tone that small quantities of milk, gruel, champagne, and wine jelly were easily and painlessly retained. On the fourth day of my attendance, the 6th of September, after having spent three successive nights with the patient, he was able to sit up in bed, change his position, and even walk to a lounge without feeling any faintness, pain, and nausea; he did, in fact, so well that I could conscientiously suspend my visits altogether for a day or two, owing to urgent professional engagements in the city, and leave him in charge of a local practitioner. During my absence he got up several times, sat in an easy chair, ate with appetite, talked cheerfully, and even went down stairs upon the piazza—which was contrary to my strict orders—but, before he could reach his room again, was seized with nausea and pains in the epigastrium. These symptoms, however, were of short duration, and passed away under the careful observance of rest, a horizontal posture, and the treatment and regimen which I had prescribed.

On the 9th of September, the ninth day of the illness, I received a telegram hastily summoning me to the patient's bedside. In the morning he had been taken with a very severe chill, together with nausea and vomiting; and, when I saw him a few hours later, he was feverish, and partially delirious—temperature 105° F., pulse 135, and respirations 36. The breathing was short, rapid, and oppressed; and pressure upon the epigastrium, back, hips, and loins quite painful—so much so that the patient, although not perfectly conscious, moaned and cried while under examination. There was neither cough nor expectoration present, yet percussion and auscultation revealed beyond doubt the existence of a pneumonic infiltration of the lower and middle lobe of the right lung; and the suspicion of a complicating acute Bright's disease—croupous nephritis—first raised by the peculiar and characteristic pain in the region of the kidneys, aggravated upon pressure, was confirmed by an examination of the scanty, dark-coloured urine, which was of high specific gravity, and contained more than seventy-five per centum of albumen.

It is not my purpose to enter into a detailed report of the case as it progressed from day to day, and to reproduce the notes which I took, interesting and instructive as they might prove in connection with the first morbid cause; I shall, therefore, confine myself to a brief summary of the principal symptoms. With the advent of the pulmonary and renal troubles the acute gastric symptoms, which had greatly abated, gathered new force, and although not quite reaching their former intensity, the patient was only capable of taking and retaining very small quantities of food in solution, and in consequence of this disability of swallowing and digesting, the chief alimentation and medication had to be conducted by the rectum. The very high temperature prevalent on the first day of the

relapse, yielded readily to large and repeated doses of quinia and digitalis; which remedies exercised, however, no other beneficial effect. Although the physical signs on percussion showed marked dulness, and the absence of the normal respiratory murmur, with slight crepitant and mucous râles, the local and usually obvious pulmonary symptoms were almost entirely masked—owing, no doubt, to the great depression and mental apathy of the patient. The disorder assumed the decided type of a typhoid pneumonia; the feverish flush of the face, so plainly marked in the beginning, making room to a livid and dusky hue, the skin being most of the time cold and clammy, and partially covered with petechiæ, the tongue coated with a dry, brownish-black fur; the gums, lips, and teeth incrustated with black sordes, the pulse growing steadily weaker, smaller, and more compressible, and the mental state more apathetic and obtuse. The liver and spleen were found to be abnormally enlarged. In spite of the frequent desire of micturition, the secretion of the urine was nearly suppressed, and as the bladder was wholly inactive, the water had to be drawn off by the catheter, and remained throughout scanty, dark-coloured, albuminous, and of a high specific gravity. The bowels also persisted in their torpid condition, and no defecation was obtainable without laborious and frequently repeated clysters. The most marked and distressing symptoms, however, were confined to the nervous system. I refer more particularly to a continual restlessness and insomnia, which baffled all treatment. Morphia, atropia, hyoscyamia, and chloral were employed singly and in combination, but produced no lasting and refreshing sleep; and the patient, while apparently and for a short time under the effect of a narcotic, would restlessly toss about and sigh, moan and mutter, as if in agony or under the dread influence of horrible dreams.

There were occasionally brief intervals of apparent improvement, during which the patient was perfectly rational, and even cheerful, displaying interest, expressing gratitude, and considerably appealing to his friends not to be too much concerned about him; but these periods of amelioration were but temporary, and not calculated to kindle any new hopes. Later on the obtuse condition of the intellect changed to a decided stupor, with low, muttering delirium. The patient was only with difficulty aroused, and appeared unwilling to be questioned, or in any way disturbed. Deglutition and rectal feeding and medication became almost impracticable, and life was chiefly sustained by hypodermic injections of cognac, camphor, and musk. On the 17th of September the patient was so greatly prostrated as to involve the probability of a speedy, fatal termination. Shortly after noon he lapsed into unconsciousness, and after remaining in this condition about an hour, with occasional glimpses of recognition of his physician and friends, the action of the heart grew faint, the pulsation at the wrist ceased, and he expired without the slightest struggle—calmly passing away.

Autopsy.—Thirty hours after death I made the autopsy in the presence and with the kind assistance of Drs. Geib, Lewis R. Hurlbutt, and Hurlbutt, Jr.

Rigor mortis not well marked; body greatly emaciated, and adipose tissue entirely wanting. The cutaneous surface presented a decided icterode hue, with large ecchymoses, especially on the posterior parts of the body. Both pleuræ were adherent throughout, but more particularly the right one. There was no effusion of serum. The lungs exhibited evidences of recent congestion and œdema, with softened and puriform in-

farcions scattered over their surface. The lower and middle lobes of the right lung were the seat of a hypostatic pneumonia, which had scarcely passed the stage of hyperæmia. The lung-parenchyma was dark, reddish-blue, congested, and partially gorged with blood, resembling in consistence and anatomical structure the spleen. There were here and there scattered very small, almost unrecognizable patches of red hepatization, which showed upon section a granular texture, and from whose alveoli oozed a lymphoid serum, slightly tinged by fibrinous coagula.

Heart enlarged, pale, and flabby; its cavities, especially the left one, considerably dilated, but walls not markedly hypertrophied. The mitral valve was swelled and thickened; the other valves, however, appeared perfectly normal; the right auricle was dilated, and so much attenuated as to be almost transparent. Liver and spleen were enlarged and congested; gall-bladder enormously distended, and filled with dark, concentrated bile. The stomach contained about an ounce and a half of a dark fluid, strongly smelling of musk, and was covered with a puruloid mucus, upon the removal of which there appeared a diffused congestion of the entire mucous membrane, with serous infiltration of the submucous coat. The congestion varied from a bright-red to a dark-livid, and even blackish-brown colour, and in those spots where the inflammation and discoloration were most intense the mucous membrane was not only softened, and could be readily detached, but the anatomical lesions penetrated to the submucous coats as if they had been produced by the chemical action of a slightly corrosive poison. Isolated ecchymoses were also apparent throughout the whole extent of the stomach.

The entire intestinal tract from the duodenum to the rectum bore evidences of congestion and inflammation; the mucous membrane was swollen, congested, softened, here and there covered with a layer of fibrinous exudation, and in other places even more thoroughly disorganized. There was scarcely any fecal matter present, and no traces of the ingested mushrooms could be detected.

The kidneys were abnormally large and swollen; the cortex grayish-white, pale, mottled with red spots, the capsule not adherent. The bladder was enlarged, and filled with about two ounces of a thick, milky fluid.

The brain and spine were not examined.

The necropsy thus fully confirmed the more or less active inflammation of the stomach and intestines produced by the direct toxication of the ingested mushrooms, and the complicating nephritis and pneumonia which owed their existence undoubtedly to the influence of the same noxious cause. That the dangerous collapse in the beginning of the patient's illness, together with the great prostration and exhaustion to which he finally succumbed, were chiefly, if not solely, due to the same *materia peccans*, seems beyond all doubt.

Having given a somewhat detailed account of the case with all its salient features, it is scarcely necessary to add any remarks, and to dwell any further upon the various points of interest. I would only lay particular stress upon the favourable action of atropia in such cases. To be sure, it did not prevent a fatal issue in this instance, because probably employed too late; but it nevertheless caused such a great improvement in all symptoms as to give rise to the hope of a favourable termination.

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